

**Alabama High School Science
Curriculum Standards, 2005**

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Chemistry	Boardworks High School Chemistry Presentation
1. Differentiate among pure substances, mixtures, elements, and compounds.	Compounds Introducing Atoms Solutions
Distinguishing between intensive and extensive properties of matter	–
Contrasting properties of metals, nonmetals, and metalloids	Electron Structure and the Periodic Table Patterns of Behavior
Distinguishing between homogeneous and heterogeneous forms of matter	–
2. Describe the structure of carbon chains, branched chains, and rings	Giant Covalent Structures
3. Use the periodic table to identify periodic trends, including atomic radii, ionization energy, electronegativity, and energy levels.	Electron Structure and the Periodic Table Energy Sublevels Electronegativity Orbitals Patterns of Behavior
Utilizing electron configurations, Lewis dot structures, and orbital notations to write chemical formulas	Covalent Bonding Ionic Bonding
Calculating the number of protons, neutrons, and electrons in an isotope	Isotopes Relative Atomic Mass
Utilizing benchmark discoveries to describe the historical development of atomic structure, including photoelectric effect, absorption, and emission spectra of elements, examples: Thomson's cathode ray, Rutherford's gold foil, Millikan's oil drop, and Bohr's bright line spectra experiments	Introducing Atoms The Photoelectric Effect Observing Line Spectra
4. Describe solubility in terms of energy changes associated with the solution process.	Solutions Solubility
Using solubility curves to interpret saturation levels	–
Explaining the conductivity of electrolytic solutions	–
Describing acids and bases in terms of strength, concentration, pH, and neutralization reactions	Neutralization Properties of Acids and Alkalis pH and Indicators
Describing factors that affect the rate of solution	Rates of Reactions Solubility

Solving problems involving molarity, including solution preparation and dilution	–
5. Use the kinetic theory to explain states of matter, phase changes, solubility, and chemical reactions. Example: water at 25 degrees Celsius remains in the liquid state because of the strong attraction between water molecules while kinetic energy allows the sliding of molecules past one another	Changing State Particles in Action Rates of Reactions Solubility
6. Solve stoichiometric problems involving relationships among the number of particles, moles, and masses of reactants and products in a chemical reaction.	Gases and Moles Molar Mass Percentage Composition by Mass Relative Atomic Mass Relative Formula Mass What are Moles? Yield and Atom Economy
Predicting ionic and covalent bond types and products given known reactants.	Covalent Bonding Giant Covalent Structures Ionic Bonding Ionic Compounds
Assigning oxidation numbers for individual atoms of monatomic and polyatomic ions.	Oxidation Numbers
Identifying the nomenclature of ionic compounds, binary compounds, and acids	Naming Compounds
Classifying chemical reactions as composition, decomposition, single replacement, or double replacement	–
Determining the empirical or molecular formula for a compound using percent composition data	Types of Formula
7. Explain the behavior of ideal gases in terms of pressure, volume, temperature, and number of particles using Charles's law, Boyle's law, Gay-Lussac's law, the combined gas law, and the ideal gas law.	Ideal Gas Laws
8. Distinguish among endothermic and exothermic physical and chemical changes. Examples: endothermic physical—phase change from ice to water; endothermic chemical—reaction between citric acid solution and baking soda; exothermic physical—phase change from water vapor to water; exothermic chemical—formation of water from combustion of hydrogen and oxygen	Exothermic Reactions Endothermic Reactions
Calculating temperature change by using specific heat	–
Using Le Châtelier's principle to explain changes in physical and chemical equilibrium	Le Chatelier's Principle
9. Distinguish between chemical and nuclear reactions.	–
Identifying atomic and subatomic particles, including mesons, quarks, tachyons, and baryons	–
Calculating the half-life of selective radioactive isotopes	Radioactivity Half-life
Identifying types of radiation and their properties	Types of Radiation
Contrasting fission and fusion	Nuclear Fission Nuclear Fusion

Describing carbon-14 decay as a dating method

Radioactive Dating